Before the
Federal Communications Commission
Washington D.C. 20554

In the Matter of	)	
	)	
Section 68.4(a) of the Commission's Rules	)	WT Docket No. 01-309
Governing Hearing Aid-Compatible Telephones	)	RM-8658
	)	
	)	

Comments of the Rehabilitation Engineering Research Center on Telecommunications Access

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SUMMARY

The Rehabilitation Engineering Research Center on Telecommunications Access (RERC) applauds the Federal Communications Commission (FCC or Commission) for initiating this proceeding and recommends that the Commission lift the existing hearing aid compatibility (HAC) exemption for public mobile service telephones. Over the past decade, Americans have become increasingly reliant on wireless telephones for family, business, and emergency communications. However, our nation's movement to the exclusive use of digital wireless technologies is putting wireless access in jeopardy for the millions of individuals who use hearing aids and cochlear implants. The past six years have shown little visible progress by the wireless industry in voluntarily designing access solutions that can ensure internal compatibility between wireless phones and hearing aids and that can mitigate interference so that internal coupling can be effective. The industry, working with the hearing aid industry, has created voluntary measurement techniques for RF emissions and hearing aid immunity, but the resulting standard has not yet been applied. External accessories have been developed, but these add cost and, for many, serious usability problems. To date, only isolated examples of progress have been visible with respect to long-term solutions that can make digital wireless telephones *internally* accessible, as mandated by the HAC Act, to individuals who use hearing aids and cochlear implants.

Given the language and intent of the HAC Act, the Commission has both the authority and the obligation to (1) lift the current HAC exemption for telephones used with public mobile services and (2) mandate the establishment of technical standards for *internal* wireless hearing aid compatibility. Such Commission action is squarely in the

public interest and would remove the adverse effect that the existing exemption is having on people with hearing disabilities. Evidence of technical feasibility exists in a few handsets, signaling that HAC is feasible in a marketable device, but we recognize that widespread implementation for all transmission technologies could not be achieved immediately. We recommend that the industry be given phase-in time to develop new standards and to build HAC into handsets without significantly increasing costs on a per-handset basis. Were the Commission not to act at this time, it will risk the consequence of leaving millions of hard of hearing Americans without any access whatsoever to wireless services, while 129 million hearing Americans increasingly integrate wireless telephony into their lives for improved safety, convenience, and success in the workplace.

Technical standards for compatibility must initially be based on internal inductive coupling, as the only known and implemented technology available to accommodate the embedded base of hearing aids with telecoils. Both the language and history of the 1982 and 1988 Acts reveal, however, Congress's intent that compatibility solutions not be frozen in time. Indeed, although both wireless phones and hearing aids are increasingly being built around digital technology, telecoil coupling remains a solution for an analog model. The Commission should use the instant proceeding to update the kinds of technology that are used to achieve wireless compatibility. New standards for compatibility need to reflect modern technologies, as well as the problems associated with those technologies. In addition to assessing solutions for inductive coupling, once the exemption is lifted, the industry should be directed – in conjunction with the hearing technology industry – to conduct assessments of more modern approaches to compatibility that take into consideration (1) newer models of hearing aids and cochlear

implants, (2) problems associated with microphone coupling, and (3) problems caused by interference. These assessments should strive to identify new wireless coupling strategies to increase the number of hearing devices that are usable with wireless telephones.

In order to achieve the above results, ongoing dialogue and collaborative research and testing need to be conducted among the wireless industry, the hearing aid and cochlear implant industries, consumers, audiologists, research facilities, and relevant federal agencies (the Commission and the Food and Drug Administration). We recommend that the dialogue initially take the form of a six-month negotiated rulemaking proceeding conducted by the Commission, whose purpose would be to set forth general rules and timelines for wireless compatibility. The Commission's proceeding should be followed by the creation of an industry-consumer forum, to continue the active exchange of information and ideas among all stakeholders. The goal of this forum would be to ensure that access is taken into consideration as wireless technologies change over time, and to meet the timelines established in the negotiated rulemaking.

We also recommend that, until such time as compatibility solutions are proven effective, the Commission retain its analog rule under Part 22 and direct the wireless industry to continue offering HAC analog telephones and service at the point of sale. We offer this recommendation reluctantly, because it is highly undesirable to limit hard of hearing people to analog service. Analog service must not become a permanent substitute for digital services. Compatibility solutions must be designed to permit individuals with hearing disabilities to have access to the more attractive features, packages, and pricing of digital wireless phones and services.

The RERC supports a phase-in approach that will result in all wireless telephones being compatible at the end of four years. We believe that, to ensure ongoing industry attention to the matter, manufacturers will need to be under an obligation to submit regular reports to the Commission on progress made toward compatibility solutions. In addition, both during and at the end of this transition period, the wireless industry should be required to train retail staff, managers, and other relevant personnel on compatibility measures, and to ensure the availability of accessibility information at call centers, on company websites, and in product brochures and user guides.

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I. **Introduction**

The Rehabilitation Engineering Research Center on Telecommunications Access (RERC) submits these comments in response to the Federal Communications Commission's (FCC or Commission) Notice of Proposed Rulemaking (NPRM) on whether to require public mobile service telephones to be hearing aid compatible under Section 68.4 of the Commission's rules.

The RERC is a joint project of Gallaudet University and the Trace Center of the University of Wisconsin, Madison. The primary mission of the RERC is to find ways to make standard systems directly usable by people with all types and degrees of disability, and to work with industry and government to put access strategies into place. The RERC has been involved in the research and dissemination of information on wireless telephones and hearing aids since 1996, participated in the 1996 Summit process on hearing aid access to digital wireless phones, and is an active participant in the Wireless TTY Forum of the Alliance for Telecommunications Industry Solutions, a forum designed to achieve digital wireless access for TTY users. The RERC project is funded

by the National Institute on Disability and Rehabilitation Research of the U.S. Department of Education.

II. The Commission has the Authority and the Responsibility to Revoke the Exemption for Digital Wireless Telephones, and to Mandate Technical Standards Governing Compatibility with Hearing Aids and Cochlear Implants.

A. The wireless industry's failure to offer accessible products compels Commission action.

The RERC applauds the Commission for opening the present rulemaking proceeding. Since 1988, telephones used with public mobile services have been exempt from requirements to be hearing aid compatible under the Hearing Aid Compatibility (HAC Act).[1] As the Commission notes, well over a decade has passed during which the Commission has been under an obligation to periodically review that exemption.[2] In the meantime, growth in the use of wireless telephones has been staggering. Currently, there are 129 million wireless subscribers in the United States.[3] This represents an increase of more than 28% over the prior year, and a growth rate that approximates 20% throughout the 1990s. In part, this growth has been the result of attractive packages and reduced prices, which have made purchasing digital wireless services affordable for many more Americans. Service plans which bundle local and long distance calling have even caused some people to switch to wireless communications, and to give up entirely their reliance on fixed wireline telephones.

In 1995, the HEAR-IT-NOW Coalition, concerned about the rollout of digital wireless telephones – known to be incompatible with most hearing aids – filed a petition to lift the exemption for wireless telephones used with personal communications services

[1] P.L. 100-394, codified at 47 U.S.C. § 610(b)(2)(A).
[2] NPRM at ¶12; 47 U.S.C. § 610(b)(2)(C)
[3] Information retrieved from CTIA website (www.wow-com.com), Jan. 9, 2002.

(PCS). At that time, the Commission was reluctant to delay the deployment of digital wireless services and extracted a promise from industry to voluntarily resolve the compatibility issue. To this end, in 1996, the "Hearing Aid Compatibility and Accessibility to Digital Wireless Telecommunications Summit" was convened. The Summit produced working groups whose purposes were (1) to create interim and long-term solutions for hearing aid compatibility and (2) to develop solutions that would reduce interference caused by the interaction between wireless phones and hearing aids. While there has been considerable work done by both the wireless and hearing aid industries to develop consensus measurement techniques for measuring handset RF emissions and hearing aid immunity, to date little visible progress has been achieved with respect to long-term solutions that can make digital wireless telephones accessible to individuals who use hearing aids and cochlear implants.

We have tracked industry process since the Summit in 1996 and unfortunately must conclude that the promises of accessibility made to the Commission in 1996 have not been fulfilled. It was this concern that led the Wireless Access Coalition, in October of 2000, to ask the Commission to re-open the HEAR-IT-NOW petition, so that the wireless HAC exemption could be lifted. Since that time, virtually all consumer groups have expressed their full support for the elimination of this exemption, and all have expressed their considerable frustration with the lack of industry progress to date on this

issue.[4] With no prospects of hearing aid compatibility in the foreseeable future, we share the concern of these groups that the wireless industry is not likely to act on its own initiative to make digital products accessible. We see this as an instance in which the Commission must act, as it has done so often in the past, to compensate for the market failures that have produced what are now inaccessible digital wireless services. As the Commission is well aware, legislative and regulatory action have been necessary to ensure access to television programming (through captioning and video description), wireline telephones (through hearing aid compatibility and volume control), the telephone network (through telecommunications relay services), and, indeed, wireless telephones (through the E-9-1-1 Order, requiring these systems to be compatible with TTYs). We call upon the Commission to exercise its authority to ensure disability access – this time to ensure access to digital wireless communications.

B. **A measurement standard alone is insufficient; technical standards are needed to ensure accessibility and compatibility.**

According to the Commission, various wireless providers maintain that it is premature to begin this rulemaking because the industry has developed a measurement technique for categorizing telephone models according to their levels of RF emissions and hearing aids according to their immunity to those RF emissions.[5] This technique

[4] *See e.g.,* Comments of Self Help for Hard of Hearing People (SHHH) at 10; Comments of Council of Organizational Representatives on National Issues Concerning People who are Deaf or Hard of Hearing (COR) at 1; Comments of Telecommunications for the Deaf, Inc. (TDI); See also Comments submitted by the Alexander Graham Bell Association (AG Bell) at 2-4 and Comments submitted by the National Association of the Deaf (NAD) at 1, each in response to *In the Matter of Year 2000 Biennial Regulatory Review: Amendment of Part 22 of the Commission's Rules to Modify or Eliminate Outdated Rules Affecting the Cellular Radiotelephone Service and Other Commercial Mobile Radio Services*, WT Dkt. No. 01-108, Notice of Proposed Rulemaking (released May 17, 2001) (hereinafter referred to as Biennial Regulatory Review).

[5] NPRM at ¶13, citing Comments of the Cellular Telecommunications and Internet Association, Comments of Verizon, and Comments of the Telecommunications Industry Association..

assigns values to ranges of measured telephone RF emissions and hearing aid immunity; when added together, the combined scores provide a prediction of the usability of a particular telephone and hearing aid combination.[6] However, a measurement standard, in and of itself, is insufficient to address the accessibility and compatibility issues associated with digital wireless phones. There are a number of reasons for this:

First, as the Cellular Telecommunications and Internet Association (CTIA) acknowledges, the measurement standard adopted by ANSI is optional, not mandatory. CTIA has reported that it intends to incorporate a requirement for the testing and characterization of handsets with respect to the amount of interference that they cause in its *voluntary* certification program.[7] There are no assurances that all, or even most, wireless manufacturers will participate in this program.

Second, the effectiveness of this standard has been questioned by the hearing aid industry's trade association. Specifically, concerns have been raised about the reliability of the measures.[8]

Third, since the standard has not yet been applied to products, there is still no consumer benefit to the work. Although the measurement standard was adopted by ANSI last April, to our knowledge, no test results have been made public.

Fourth, it is not known whether the predicted performance of hearing aid and wireless phone combinations will be valid in field conditions, nor whether the categories created will provide understandable guidance to consumers.

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[6] American National Standards Institute (ANCI) Standard C63.19, adopted on April 26, 2001.
[7] NPRM at ¶13.
[8] Comments of David Woodbury, representative of the Hearing Industries Association, FCC meeting held on May 30, 2001.

Fifth, a measurement standard is of little value if the telephones to which it applies are not made hearing aid-compatible. In other words, without solutions to the problem, the vast majority of wireless handsets may test out as unusable. Industry funds would have been expended for testing, with no public benefit. As the Commission notes, this standard does not constitute an "established technical standard for hearing aid compatibility" as would be required by the HAC Act, were the FCC to lift the wireless exemption.[9] Both research and anecdotal evidence consistently confirm that audible interference renders it difficult or impossible to use a digital wireless telephone with many or most hearing aids. Without technical standards that require accessible design, there are likely to be very few telephone/hearing aid matches that actually offer compatibility for hearing aid wearers. Such standards are critical to ensure the effective use of wireless phones once the exemption is lifted.

C. **The Commission should lift the exemption for all CMRS**

In its petition to the Commission, the Wireless Access Coalition sought only to revoke the HAC exemption for PCS. As the Commission notes, however, Congress has since replaced this category of wireless services with a broader category that includes all commercial mobile radio service (CMRS) providers.[10] In this environment, we agree with the Commission's decision to evaluate the merits of continuing or lifting the exemption for all CMRS to the extent that they offer "real-time, two-way switched voice service that are interconnected with the public switched network."[11] Such action is consistent with the HAC Act, which did not distinguish among various types of wireless

[9] NPRM at ¶16.
[10] *Id.* at ¶30.
[11] *Id.* at ¶30.

services, but rather created a temporary exemption for all public mobile service telephones. At the time that Congress created this exemption, it made clear its intention that such exemption be temporary, pending periodic assessments by the Commission.[12] As the Commission acknowledges "[a]nticipated improvements in both telephone and hearing aid technologies" were expected to eliminate the need for this exemption in the future.[13] Thus, the Commission is well within its authority, and indeed has a statutory directive to now address the appropriateness of lifting or phasing out the HAC exemption for all wireless services.

III. The Statutory Criteria for Revocation of the Wireless Exemption Have Been Met.

The HAC Act directs the Commission to revoke or limit the exemption for public mobile service telephones so long as four criteria are met. This section discusses each of these criteria.

A. Revocation of the mobile exemption is in the public interest.

Although owning a wireless telephone may have once been a luxury, it is now considered a necessity. We agree with the Commission that the ability to have instant telephone communications, anytime, and anywhere, has become indispensable.[14] Parents routinely depend on wireless communications to keep in contact with their children. Employers use wireless devices to contact their employees for last minute assignments and other urgent matters. Field workers in many lines of business and professional life are now dependent on wireless telephones for effective performance. Senior citizens

[12] *Id.* at ¶12 n. 31, citing S. Rep. No. 100-391 at 8 (Comm. on Commerce, Science, and Transportation) (1988).
[13] NPRM at ¶14.
[14] *Id.* at ¶15.

depend on wireless phones to maintain their independence and productivity. And most importantly, wireless phones are invaluable for all people in emergency situations. In each of the past few years, tens of millions of calls have been made from wireless telephones to 9-1-1. According to CTIA, within five years from now, the wireless industry will be able to locate within 125 meters, callers who use wireless services to call 911, enhancing even more the utility of these phones.[15] Since the events of September 11, the need for a wireless phone has become even more pronounced. Reliance upon wireless access on that day allowed countless individuals to communicate with loved ones. Wireless communications on the fourth plane may have saved thousands of lives by providing immediate information to passengers about the fate of the World Trade Center, leading them to divert the plane from the terrorists' targeted destination.

Time and again, Congress has established that it is in the public interest to enable individuals with disabilities to take advantage of new telecommunications technologies to the same extent as do all other Americans. As many as twenty years ago, Congress stated:

> One of the most frustrating aspects of hearing impairment and deafness is the inability to use telecommunications media on which modern life has grown so dependent. . . .The inability to use this instrument . . is not only a practical disability but a constant source of dependency and personal frustration. . . . [M]aking the benefits of the technological revolution in telecommunications available to all Americans, including those with disabilities, should be a priority of our national telecommunications policy.[16]

[15] Information retrieved from CTIA website (www.wow-com.com), Dec. 20, 2001.
[16] H.R. Rep. No. 97-888, 97th Cong., 2d Sess. at 4-5 (1982) (Comm on Energy and Commerce) (H. R. Rep. No. 97-888).

Through passage of the Telecommunications for the Disabled Act of 1982,[17] the Hearing Aid Compatibility Act of 1988, the Telecommunications Accessibility Enhancement Act,[18] Title IV of the Americans with Disabilities Act,[19] Section 255 of the Telecommunications Act,[20] and Section 508 of the Rehabilitation Act,[21] Congress has mandated that individuals with hearing disabilities be included in the benefits of modern telecommunications. As previously noted by the Commission, Congress has recognized that communications is "now an essential component of American life," and as such is needed "to provide people with disabilities access to employment, independence, emergency services, education, and other opportunities."[22]

Lifting the HAC exemption for digital wireless services is necessary to fulfill our nation's mandate to ensure telecommunications access the growing number of persons who use hearing aids and cochlear implants and whose accessibility is being jeopardized by the rapid move to digital wireless technology without adequate provision for accessibility. For this reason, lifting the exemption is squarely in the public interest.

B. **The mobile exemption has an adverse effect on people with hearing disabilities.**

One in ten Americans has some degree of hearing loss. Estimates of the number of hearing aids in use in the U.S. range from 4.5 to 6 million. Tens of thousands of additional Americans use cochlear implants, with the number of implant recipients

[17] P.L. 97-410, codified at 47 U.S.C. §610, as amended. The 1982 required that certain "essential" telephones be made hearing aid compatible.
[18] P.L. No. 100-542, codified at 40 U.S.C. §762.
[19] P.L. No. 101-336, codified at 47 U.S.C. §225.
[20] P.L. No. 104-104, codified at 47 U.S.C. §255.
[21] P.L. 105-220, Title IV, §508(b), codified at 29 U.S.C. §794(d).
[22] *Implementation of Section 255 of the Telecommunications Act of 1996; Access to Telecommunications Services, Telecommunications Equipment and Customer Premises Equipment by Persons with Disabilities,* Report and Order and Further Notice of Proposed Rulemaking (Section 255 R&O), WT Dkt. No. 96-198, 14 FCC Rcd 20391 (Sept. 29, 1999) at ¶4.

steadily on the rise. Until fairly recently, individuals with hearing aids and cochlear implants were able to use analog cellular services for their wireless telephone communications. Some analog cellular telephones were hearing aid compatible and did not generally create interference.

Unfortunately, few manufacturers still make analog cellular phones. Additionally, many providers that offered analog service in the past no longer sell it. The percentage of wireless subscribers now using digital services is as high as 62%, up 30% from 1998.[23] The Commission acknowledges this point in its reference to the Fifth Competition Report on Commercial Mobile Services, a report which confirms that analog service is being replaced with "more efficient, feature-rich digital services that are offered at competitive prices."[24]

Providers are also discouraging existing customers from staying with analog service through the use of sales practices, higher rates, and less attractive service plans. In some cases, hearing aid wearers are being told that a failure to switch their existing telephone plans to digital services will result in an increase in their monthly rates, despite the fact that they cannot use digital phones.[25] Additionally, some carriers with all digital networks have never offered analog service at all. A look back to the enactment of the HAC legislation will show that, regrettably, we are watching history repeat itself.

For much of the 20th century, telecoil-equipped hearing aids were able to inductively couple with standard wireline telephones. The telephone receivers emitted

[23]Some wireless carriers, such as AT&T Wireless, have already dropped analog service as an option at the point of sale.
[24] NPRM at ¶21, citing Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, Fifth Report, FCC 00-289, 15 FCC Rcd 17,660 at 17,672-73 (2000).
[25] *See* Biennial Regulatory Review Comments of TDI at 5 (July 2, 2000); Letter from Lisa Devlin to the Commission (July 25, 2001).

electromagnetic energy, which could be picked up via telecoils, small internal transducers in the users' hearing aids. This inductive coupling enabled users to hear the speech signal without feedback and with reduced background noise. However, beginning in the mid-1960's, telephone receivers with significant reductions in electromagnetic leakage began to be introduced. To the dismay of hearing aid wearers, a significant and growing number of the phones then on the market were no longer hearing aid compatible. The result was that people who had previously enjoyed access to telephone services were being prevented from using those very same services. The telecommunications industry at the time was unwilling to develop an internal solution to this incompatibility problem, suggesting that doing so was infeasible and that costs would be prohibitive. However, when alerted to the potential loss of telecommunications access, Congress took steps to restore access for people with hearing disabilities by enacting the 1982 and 1988 accessibility laws. Passage of these laws resulted in industry's development of a feasible and economical means of providing internal inductive coupling for all telephone handsets.

Two decades later, today's consumers are having the same experience, as industry moves from analog phones and services to digital wireless phones and services. In recent years, wireless carriers have seized upon the opportunity to take advantage of new FCC rules that offer "cellular flexibility" by moving their subscriber bases to digital communications. In accordance with this trend, the Commission recently opened a proceeding asking about the merits of continuing analog service at all.[26] The Commission's Year 2000 Biennial Regulatory Review proceeding questions whether

[26] Biennial Regulatory Review, *supra* n. 4.

carriers who provided analog service in the past should be permitted to discontinue this service, in the interest of furthering competitive trends that expand the availability and diversity of digital technologies.[27] Even were these carriers required to continue providing such service to existing analog subscribers and roamers,[28] nothing in the Commission's Part 22 rules appears to require that they continue to offer analog service *at the point of sale*. Preliminary efforts to determine the availability of analog service at the point of sale in the Washington D.C. metropolitan area suggest that consumers are no longer able to purchase analog service and equipment from carriers in this geographical region.[29]

The result is that individuals with hearing disabilities who wish to purchase their first cell phones, or to switch carriers, are being left without accessible options.

This predicament is virtually identical to that which they experienced more than two decades ago, and which led to passage of the 1982 and 1988 HAC Acts. The wireless access which they originally enjoyed along with the rest of the population is rapidly disappearing. The Commission has acknowledged that "digital technologies are, for the most part, not currently compatible with hearing aid technologies."[30] In fact, a recent survey of hearing aid wearers conducted in the United Kingdom showed that "the vast majority of hearing aid wearers have extremely limited or no success at all in using a

[27] *Id.* at ¶24-25.
[28] This is the existing "analog rule." 47 C.F.R. §22.901.
[29] The retail outlet for Verizon Wireless reports that if the customer can supply the analog phone, Verizon will provide analog service.
[30] Biennial Regulatory Review at ¶ 30, citing Letter from the Wireless Access Coalition to the Secretary, FCC (dated Oct. 7, 2000).

(GSM) digital mobile phone."[31] In that study, 62% of the hearing aid wearers were *unable* to effectively use their hearing aid directly with a digital phone.[32] In contrast, 92% of these same individuals reported being able to use their domestic wireline phones without difficulty[33]. The study concluded that "hearing aid wearers are being severely disadvantaged in the fast-paced mobile telecoms revolution."[34]

That digital wireless services remain inaccessible to individuals who are hard of hearing is also evidenced by the outpouring of consumer comments to the FCC on this issue. Many who have submitted comments have reported having no success finding a digital mobile phone that is compatible with their hearing aids.[35] Several of these individuals have expressed concerns about the needs of our aging population to maintain its independence.[36] Others have emphasized the need to ensure access for children with hearing disabilities. For example, one woman expressed the fear that the lack of wireless access could prevent her otherwise high functioning hard of hearing child from becoming

[31] Survey: Hearing Aids and Digital Mobile Phones, A Survey of the Experiences of Hearing Aid Wearers - A Report for Hearing Concern & Telecommunications Action Group (United Kingdom, March 2001) at §5.4 (UK Survey). The survey sought responses from over 320 individuals, representing a cross-section of the population of hearing aid users, over a five month period from April to September 2000. Because the standard utilized by European wireless telephone manufacturers is GSM, respondents were only reporting on their experiences with this type of wireless technology.

[32] *Id.* at §§5.1; 5.4. Although 38% received a usable or clear signal with a digital phone, only 17% were able to use the phone with their hearing aids. Of these, only one individual said that he/she could hear the communication clearly.

[33] *Id.*

[34] *Id. at* §1.

[35] *See e.g.,* Comments of Ben Gilbert (Oct. 2, 2000) (unable to use any of the telephones distributed by United Airlines when he and other passengers were stranded); Comments of George DiVilbiss (Sept. 30, 2000); Comments of Sonya Miller (Oct. 31, 2000); Comments of Anne Moore (Oct. 5, 2000).

[36] Comments of Donna Galati (Sept. 28, 2000) ("We cannot cut this huge population from the ability to function in everyday life with cellular communications;" Comments of Nancy Hammons (Sept. 27, 2000) ("Millions of baby boomers [] are becoming hearing impaired in their golden years"); Comments of Clyde Hostetter (Oct. 31, 2000) (75 year-old man concerned about the need for access by baby boomers).

a contributing member of society.[37] Still others wrote in that they fear for their safety without adequate wireless access.[38] Finally, many expressed worries about not being able to secure or maintain gainful employment without digital access.[39] Indeed, as a potentially new barrier to employment, lack of digital access runs counter to our nation's overriding objective – as expressed in the Americans with Disabilities Act and the Rehabilitation Act – to eliminate job discrimination on the basis of disability.[40] As these technologies become even more entrenched, and as digital networks continue to be built out, wireless telephones are likely to gradually replace landline phones for many people, further increasing the dependency of populations denied access to these telecommunications systems.

The recent trends in reducing analog service offerings is beginning to have an adverse effect on individuals with hearing disabilities, and the urgency of the situation will only increase over the next year. Even where analog services are available (e.g., for existing customers), they are more expensive and offer far fewer features than their digital counterparts. As our nation moves to the utilization of digital-only wireless technologies, persons with hearing disabilities are in danger of not having access to any

[37] Comments of Cyndi Marshall (Sept. 28, 2000).
[38] Comments of Mary Elizabeth Moore (Oct. 15, 2000) (needs wireless access because she regularly travels on back roads for her job); Comments of Anna Dee Ross (Sept. 28, 2000) (woman who was in an automobile accident, but could not understand the 911 operator on her mobile phone.); Comments of Sharon Doug Shatas (Sept. 30, 2000) (worried about road safety for a loved one); Comments of Judy Siciliano (Sept. 28, 2000) (wants car safety).
[39] Comments of Bruce Winter (Oct. 3, 2000) (real estate broker who is concerned that "natural hearing deterioration will preclude my being able to earn any income in the future"); Margaret McGovern (Sept. 28, 2000) (woman whose son lost two jobs because of an inability to use a mobile phone); Mary Elizabeth Moore (Oct. 15, 2000) (teacher who travels to various schools and requires wireless access to attend to the urgent needs of special needs children and to attend last minute school meetings); Comments of Bob Russell (Oct. 5, 2000) (manager who worries that digital phones will put him at a disadvantage in the business world).
[40] Biennial Regulatory Review Comments of the NAD at 3, noting that mobile communications are necessary for many jobs, from blue collar to professional positions.

mobile telephone services at all, or being relegated to an inferior and outmoded wireless technology. FCC action is urgently needed to prevent this from occurring.

C. **Some of the newer products on the market give evidence that it will be technologically feasible to achieve compatibility between wireless telephones and hearing aids.**

History has shown that industries often oppose a requirement for accessibility on the basis of technological infeasibility, but given some time and an absolute requirement, they are able to deliver products with built-in accessibility without raising the price of those products or damaging the industry. In cases such as this, where new research and development are required to solve the problem, an absolute requirement on manufacturers is essential to level the playing field and ensure industry-wide progress toward the goal of accessibility.

From the outset of efforts to investigate and achieve wireless telephone compatibility with hearing aids, the focus has been on mitigating interference, and the assumption has been that the traditional *analog* method of inductive coupling, as specified in Part 68, would be used. There has not been much serious discussion of technological migration toward *digital* technologies for wireless coupling with hearing aids, although wireless phones have become digital and hearing aids are in the process of doing so. As discussed later in these comments, digital coupling technologies are very promising because they are specifically designed for wireless coupling for purposes of voice communication. Since the wireless and hearing aid industries have yet to engage in coordinated efforts to explore such methods of internal coupling, it is not possible to make definitive statements about feasibility or infeasibility of using newer technologies.

Since the 1996 Summit, there has been consensus among all stakeholders that a coordinated effort – in which both hearing aids and wireless telephones would be modified – was needed to allow the two devices to work together effectively.

On the hearing aid side, manufacturers have set about improving the immunity of their products to ambient interference. Hearing aid manufacturers have ample reason to harden hearing aids, because security systems, televisions, computer monitors and other devices emitting an electromagnetic field of sufficient strength have the potential for causing interference. Although hardening hearing aids can prove beneficial for hearing aid wearers, this, by itself, is not likely to be enough to get rid of the significant interference experienced by wireless telephone users. Wireless telephones are used right next to the ear and their purpose is two-way communication using hearing and speech. The pulsing nature of wireless telephone interference is unique, and is not shared by other devices that emit electromagnetic fields. Solving for ambient interference does not necessarily result in a solution for wireless telephone interference. Because of these unique factors, eliminating interference for hearing aid users to the point where they can effectively use wireless phones is not likely to be achievable by the hearing aid industry alone.[41]

On the phone side, sources of interference need to be addressed. Many digital wireless telephones already possess components that provide the magnetic field needed for the telecoil to pick up a speech signal. Our experience with recent model phones is

[41] During the past few years, hearing aid companies have started to advertise improved immunity in their products. However, it appears from our clinical experiences with hearing aids and wireless telephones that even these advertised aids – which are typically quite expensive ($5,000-$7,000 per pair) – are not entirely immune. Additionally, although the hearing aid industry does appear to have measures in place for immunity in order to make these claims, it is not clear whether they are using the ANSI C.63.19-2001 measurement standard. In any event, very few consumers who need to acquire a wireless phone can afford to buy these high-end devices, which are generally not covered by third-party payers.

that hearing aid wearers who use telecoils can detect at least the *presence* of speech on many wireless telephones.[42] If indeed these phones do possess an adequate magnetic field for transducing speech, they are nevertheless not HAC because of the interference factor. Such interference stems from at least two sources: RF emissions at the antenna, and stray magnetic energy from such sources as back-lighting and electronic communications within the handset. The magnetic fields are pulsed as well, since they are affected by the RF transmissions emanating from the antenna.[43] Methods of mitigating this interference include the use of handset forms that block or distance the RF and electronics from the hearing aid, altering the placement of telephone antennas, providing improved internal shielding of handsets, and providing the ability to turn off backlighting in any and all circumstances. There are doubtless other strategies known only to industry that could improve the situation.

Differences among transmission technologies appear to be the most important factor for the current generation of phone products. Some studies, as well as consumers' anecdotes, indicate that of all the wireless technologies, GSM is the most problematic for hearing aids and CDMA is the least problematic.[44] The evidence does not mean that CDMA will work for every consumer, but that some CDMA phones (not all) probably offer, overall, the best of a bad situation. (The vast majority of consumers are completely unaware that choice of technology, and therefore carrier, is an important consideration.)

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[42] However, our group does not have the facilities to measure whether or not these phones meet the HAC standard established for landline phones.

[43] Linde T, Mild KH., Bioelectromagnetics 1997;18(2):184-6

[44] Burwood, E. (1999). Assessment of Interference to Hearing Aids Used in Australia by CDMA Digital Mobile Phones, Australian Hearing Services, National Acoustic Laboratories; Srinivasan, S., Schlegel, R.E., & Grant, H. (1998). Evaluation of the Interaction of Wireless Phones and Hearing Aids, Phase II-B. U. of Oklahoma, Center for the Study of Wireless EMC.

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Using CDMA phones and carriers, some consumers report being able to use a small number of phone models with their telecoil-equipped hearing aids, without HAC accessories. To date, these phones have not been advertised as being HAC or as being otherwise accessible, so the general population of hearing aid wearers remains unaware of their existence. The Samsung SCH3500 (which is unfortunately no longer on the market) and the LG TM510 are two such phones. The existence of consumer success with these phones gives rise to the expectation that HAC is now technologically feasible in a marketable wireless phone, at least for CDMA. We note that both of these phone models have flip-up covers that help to block the antenna and that distance the antenna and handset circuitry from the hearing aid by a small amount of space that may significantly reduce interference. (Note that this feature is not necessarily the only reason for the reported success of these phones.)

TDMA and GSM produce more-disruptive interference and will be more problematic, but they cannot be ignored. GSM presence in U.S. networks is expected to mushroom in the next few years, as large carriers currently using TDMA move to all-GSM. In fact, GSM could become the predominant digital technology in the U.S. The impending growth of GSM is one of the reasons that we consider this proceeding to be so important and timely.

Although access to GSM technology presents special challenges, the problems posed by this technology can be addressed. For example, a new approach that has been taken by Audex, Inc., in collaboration with Nokia, Inc., has been to add a component that generates a strong magnetic field for transducing speech, which can be picked up by the telecoil in a hearing aid worn on the other side of the head. The hearing aid wearer holds

the phone in its normal-use position, but on the opposite ear from the ear used for listening. The RF transmission interference is blocked by the head. This technology is not yet on the market, but it was demonstrated at the CTIA show in March of 2001 and at the SHHH convention in June of 2001. It will be sold only as an accessory, but if it proves to be effective and is built into the handset, it might successfully handle even the more difficult forms of interference.

iDEN technology has not been the subject of much research in the public domain. However, the RERC has included iDEN in clinical case studies now under way. In these studies, a research audiologist with knowledge of wireless phone technology assists consumers as they try wireless phones and accessories on all four digital technologies, and select one to use for a month. We were encouraged to find that two of six telecoil users with behind-the-ear aids participating in the study chose the iDEN phone (without accessories) over phones operating on the other technologies. The iDEN interference as manifested in acoustic form may be less disruptive to the speech signal, the clamshell design of the phones may have contributed to their success, or the phones may simply be manufactured better.

Despite such isolated examples that are encouraging and that indicate technological feasibility, overall, little *visible* progress has been made by the wireless industry in re-designing their products (other than to conduct accessory development). We emphasize the word "visible" because it is possible that more handsets than those mentioned here have been improved to perform better than did past devices, and that individuals within manufacturing companies are aware of this. If this is the case, however, such information has not been made available to the public.

Concerted industry action on standards development that will enable individuals with hearing disabilities to use wireless telephones has become a critical matter to which industry must attend. Achievement of HAC through the use of existing technology and the existing HAC standard alone may no longer be sufficient or advisable. As explored more fully below, assessments of more modern approaches to HAC should be completed by the wireless industry – in conjunction with the hearing technology industry – immediately after the HAC wireless exemption is lifted. Although both hearing aids and wireless phones are increasingly being built around digital technology, the technology for wireless coupling remains stuck on an analog model. This proceeding provides a unique opportunity to update the technology used for coupling. Such action would be in accordance with Congress's expectation that the technology for compatibility between the two devices would evolve (and improve) with time.[45]

D. **The incorporation of accessibility will not prevent the successful marketing of wireless telephones.**

We believe that incorporating access during the design stages of digital wireless phones will not adversely affect the marketing of these phones to the general public. There is evidence that for some technologies, it is feasible now or soon. If given phase-in time, the industry will be able to build in accessibility without retrofitting. Further, incorporating access will prevent the loss of hard of hearing customers as companies shut down analog service. As our nation's population of senior citizens increases, so too will the market for hearing aid compatible wireless telephones. According to the U.S. Department of Census, by the year 2030, individuals who are 65 and older will comprise twenty percent of America's population. The National Center for Health Statistics reports

[45] H. Rep. No. 97-888 at 5; P.L. 100-394 (1988), Congressional finding #3.

that approximately 30% of people over 65 have some degree of hearing loss.[46] According to AARP, as many as 54% of individuals over the age of 56 already use wireless telephones, primarily for security.[47] This proportion will likely rise as current cell phone users age. Thus, senior citizens alone will represent a significant market for telephones and services that will be designed for accessibility after the exemption is lifted.

A final reason that incorporating compatibility will not adversely affect the successful marketing of wireless telephones has to do with our proposed means of achieving such compatibility. As will be explored in more depth later in these comments, the RERC proposes that requirements for compatibility be phased in, over a four year period. This gradual phase-in period will allow for the successful marketing of all digital wireless telephones without detracting from sales of existing models.

IV. The Compatibility Feature Must be Internal to the Handset.

The Commission notes that, were the exemption to be lifted, wireless telephones covered under the HAC rules would need to "provide internal means for effective use with hearing aids that are designed to be compatible with telephones that meet such technical standards."[48] As the Commission explains, this requires compatibility to be provided within the telephone, rather than through external components.[49] The Commission notes, however, that many hands-free telephones have various components –

[46] National Center for Health Statistics, Series 10, Number 200, Table 57, Number of selected reported chronic conditions, per 1,000 persons, by age. http://www.cdc.gov/nchs/fastats/disable.htm, retrieved January 3, 2002.
[47] Biennial Regulatory Review Comments of AARP at 1 (August 1, 2001). AARP reports that individuals aged fifty and older make up a significant percentage of the 41.9 million Americans who still use analog service. While AARP does not speculate the reason for this, one of the reasons is likely that analog phones remain accessible to these individuals.
[48] NPRM at ¶16, citing 47 U.S.C. §610(b)(1).
[49] NPRM at ¶17.

an earphone, microphone and transceiver – and asks whether the term "internal means" can be interpreted to require inclusion in any one of these components.[50]

We point out that the HAC feature must be *internal to the handset* for a phone to be in compliance with the HAC Act. The current generation of wireless accessories are obviously external. They are sold as accessories at an additional cost (which is sometimes greater than that of the handset). They require a hook-up procedure in addition to ordinary phone operations. They can easily become separated from the phone – misplaced or simply left at home -- in which case the phone's owner would not be able to use the phone. Most or all are powered separately from the phone and can cease to function even when the phone is fully charged.

External accessories for landline phones also existed at the time of passage of the 1982 and 1988 HAC Acts. In those Acts, Congress rejected external devices as being too costly and inconvenient, and mandated instead "internal means for effective use with hearing aids." Allowing external accessories to now satisfy the requirements of these Acts would go against the plain language of these statutes.

The inductive coupling accessories on the market, such as neckloops, are, in fact, useful devices for some people who cannot otherwise use digital wireless telephones, and for a few hearing aid wearers, they even provide a better signal than landline telephones. However, for many hearing aid wearers they are too unwieldy to be useful – just as most cell phone users do not use corded handsfree accessories, despite their safety advantages for driving. In addition to the need to attend to a third set of batteries in order to complete a call (the hearing aid's, the phone's and the accessory's), and in addition to the

[50] *Id.*

cost of the inductive coupling accessories, there are usability issues associated with external devices. To begin with, the user must wire-up to make or receive calls. This is particularly burdensome when receiving calls. The need to manipulate the small components and to assemble the phone/accessory in order to answer it is likely to be particularly difficult for elderly users. In addition, the microphone is typically susceptible to ambient noise because of its location away from the mouth, and the user has difficulty knowing how loudly to speak. Although a reasonable short-term solution, this is not a long-term solution and is not in the spirit or language of the original laws.

V. The Commission Must Adopt a Practical and Contemporary Definition of "Hearing Aid Compatibility."

A. Inductive coupling via the telecoil must be supported by standards for compatibility.

At the time of the passage of the 1982 and 1988 Acts, inductive coupling was the only known means of achieving compatibility with landline telephones. Inductive coupling originated in the 1930s, when hearing aid manufacturers began adding telephone coils to their devices to take advantage of the spurious leakage of magnetic flux from telephones. Through the use of analog technology, inductive coupling has served as the only alternative to acoustic coupling of hearing aids to wireline phones since the 1950s.

At the present time, the only known and implemented mechanism for effective coupling between hearing aids and phones remains the telecoil. Millions of Americans still rely on telecoils in their hearing aids and at present, there are no other technologies

to take its place. Thus, technical standards for compatibility, once the exemption is lifted, must support inductive coupling for the embedded base of telecoil-equipped hearing aids.

It is almost certain that with the advance of digital technologies and miniaturization, we will some day see phones with miniature wireless links between the phone and phone headsets (similar to the wireless Bluetooth headsets now available but with very much smaller and lower powered electronics). When these circuits (and power demands) shrink to the scale of hearing aids it may be possible to link phones to hearing aid through some other means than electromagnetic T-coils. It is clear that more research is needed on more advanced alternatives to the telecoil.

Until such time as this or other alternate mechanisms (e.g., encrypted optical techniques) for effective coupling between hearing aids and wireless phones become available and the necessary access features are built into both telephones and hearing aids on a widespread basis, the telecoil must continue to be supported.

B. Congress did not intend to set a permanent definition of hearing aid compatibility.

While the RERC maintains that the Commission's rules must support inductive coupling for the present time (since this is the only known and effective compatibility technology today), we note that Congress intentionally avoided locking in a specific or single mechanism for achieving compatibility when it enacted the HAC legislation. The Commission notes that the HAC Act limits the compatibility requirement to hearing aids that "are designed to be compatible" with telephones that meet established standards for hearing aid compatibility."[51] The legislative history of the 1982 Act makes clear that this definition, while designed to link the telephone and hearing aid technologies in a stable

[51] NPRM at ¶18, citing 47 U.S.C. §610(b).

fashion, was not intended to "freeze technology, but rather to ensure that all persons enjoy the benefits of technological improvements in the telephone network, whether or not they are disabled."[52] The House Report accompanying the 1982 Act referred to the testimony of one industry witness:

> The door must be left open for future developments . . . There may be other solutions to the coupling problem that are far superior to today's inductive coupling. . . . Hearing aid wearers are entitled to benefit from [the] advantages that might result from advancing technology. This is particularly important in light of the obvious trend in future telephone technology which is moving toward low power, lightwave, and digital systems. These future systems are expected to use new types of receiver units which will offer many advantages: smaller size, lighter weight, improved voice quality reception, significantly lower manufacturing costs, and correspondingly lower consumer rates.[53]

After hearing this testimony, the House Committee concluded that inductive coupling was only one way to ensure the effective use of telephones by persons with hearing loss. The legislation, the Committee explained, did "not seek to entrench this technology, but rather to promote new, compatible technologies that provide improved service to all persons, with or without hearing impairments."[54]

It should also be noted that hearing aid designs and features have dramatically expanded over the last half a century. The Commission's technical standards on wireless telephone and hearing aid compatibility should take into consideration new and diverse types of hearing aid and cochlear implant technologies. In addition, as noted in the next sections, these standards must take into consideration issues associated with acoustic coupling with digital wireless phones and the interference caused by those phones.

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[52] H. Rep. No. 97-888. at 5.
[53] H. Rep. No. 97-888 at 6, citing Testimony of Dennis J. Sullivan, Jr. Assistant Vice President, AT&T Co.
[54] *Id.* at 6. The Communications Act itself requires the Commission to ensure that its rules governing hearing aid compatibility will not "discourage or impair the development of improved technology." 47 C.F.R. §610(e).

C. **Technical standards for compatibility must address microphone (acoustic) coupling.**

Inductive coupling is of particular use to people whose hearing loss is severe enough to require high gain from the hearing aid. It permits the user to circumvent acoustic coupling, which is prone to feedback at high gain and is susceptible to ambient noise, especially if the handset's design makes it difficult to couple well with the hearing aid's microphone. However, most hearing aid wearers have less severe degrees of hearing loss and use the telephone with their hearing aids set on microphone, for acoustic coupling.

Digital wireless telephones present a number of new challenges to people who use the microphone setting. Like telecoil users, these hearing aid wearers are experiencing an erosion in telephone accessibility as technology moves to digital wireless forms. Interference has a negative effect on the accessibility of wireless phones by users of hearing aids and cochlear implants, regardless of whether those devices are equipped with telecoils. People who typically function well with wireline telephones using the microphone setting often find themselves handicapped by interference and, to some extent, by handset design when trying to use a wireless telephone. Thus, any definition of hearing aid compatibility must necessarily take into account the ability of hearing aids and cochlear implants to acoustically couple with wireless telephones.

D. **Technical standards for compatibility must address issues of wireless interference.**

The technical standards for compatibility adopted by the Commission must also address interference issues. Abatement of interference is essential to the successful use of the handset. Numerous studies have shown that interference impairs the ability of

hearing aid wearers to understand speech through a wireless phone[55]. In the UK survey discussed above, three fourths of the hearing aid users responding reported "a lot" or "some" interference in using a digital phone.[56] Among other things, respondents complained about "buzzing," "humming," and "crackling. In addition, as many as ten percent of the respondents reported experiencing physical symptoms, including pain and dizziness.[57] In comments received by the Commission, several consumers also reported intense interference caused by the interaction of digital mobile phones with their hearing aids.[58] In considering the extent to which a phone is hearing aid compatible, the Commission must consider the extent to which interference caused by the phone is so great as to effectively preclude access to the phone by the hearing aid or cochlear implant wearer. Technical standards for compatibility need to allow hearing aid and cochlear implant wearers to use mobile service phones without excessive interference in the form of buzzing, crackling or other extraneous noises.

E. Coordinated efforts among stakeholders are needed to maximize the compatibility of digital wireless telephones.

Although the Hearing Aid Compatibility Summit offered a strong start to finding compatibility solutions, coordinated efforts between the wireless and hearing aid industries have diminished over the past six years. These efforts need to be revived and

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[55] Ravindran, A., Schlegel, R.E., Grant, H. (1996). Evaluation of the interaction Between Wireless Phones and Hearing Aids, Phase I. U. of Oklahoma, Center for the Study of Wireless EMC; Srinivasan, S., Schlegel, R.E., & Grant, H. (1998). Evaluation of the Interaction of Wireless Phones and Hearing Aids, Phase II-B. U. of Oklahoma, Center for the Study of Wireless EMC; Hansen, M., Poulson, T. (1996). Evaluation of Noise in Hearing Instruments Caused by GSM and DECT Mobile Telephones. Scand Audiol, 25:227-32.; Levitt, H., Harkins, J., Singer, B., & Yeung. (2001). Field measurements of electromagnetic interference in hearing aids. J Am Acad Audiol 12:275-280.

[56] UK Survey at §§5.6; 5.7.

[57] *Id.* at §5.7.

[58] Comments of George DeVilbiss (Sept. 30, 2000) (every phone in the Washington D.C. caused "annoying interference so strong as to render them useless to me"); *See also* Comments of Mary Elizabeth Moore (Oct. 15, 2000) (the interference is "constant"); Comments of Shirley McCormack (Sept. 29, 2000)) (hears "whistle"); Comments of Julie Zaremba (Oct. 15, 2000) (son with cochlear implants hears loud buzzing).

information between these two industries needs to be shared on a regular basis if compatibility solutions are to be achieved. In addition to industry representatives, stakeholders to these issues include consumer representatives, audiologists, and non-profit organizations that conduct research.

A mechanism needs to be established so that these stakeholders, together with the Commission and the U.S. Food and Drug Administration (as the federal agency responsible for overseeing the hearing aid industry), can sustain a serious effort to develop viable solutions. A joint industry-consumer process is needed to identify characteristics of hearing aids and cochlear implants that can be compatible with wireless handsets designed to (1) minimize electromagnetic interference and (2) couple well acoustically with hearing aids.

The RERC proposes a negotiated rulemaking as the optimum means of achieving this goal. Similar to that which took place with respect to hearing aid requirements for landline telephones, such a proceeding could bring together all interested parties to share relevant information about the issues at hand. A coordinated dialogue will allow stakeholders to explore the advantages and drawbacks of a range of wireless solutions for hearing aid and cochlear implant users. The RERC proposes that a committee be formed for the purpose of carrying out such a proceeding for a period of six months. During that period, committee members, with the oversight of the Commission, would be asked to agree on a proposed plan, including timelines, for achieving compatibility.

After such time that the committee has expired, it is more than likely that continued cooperation among stakeholders will be needed so that effective compatibility solutions are developed as future wireless technologies are designed and adopted. Such

dialogue and cooperation can be carried on by an outside forum, similar to that which exists for finding solutions for TTY access to wireless technologies and for disability access to interactive voice response systems. The Alliance for Telecommunications Industry Solutions (ATIS) regularly gathers stakeholders together in forums where they can discuss and resolve access issues in telecommunications. ATIS could similarly take on the task of creating and maintaining a forum designed to achieve solutions for hearing aid/cochlear implant compatibility with digital wireless technologies.

Among other issues, through these forums, the wireless industry, together with the hearing aid industry, should explore new wireless coupling technologies as one method of increasing the number of hearing devices that can be used with telephones. The goals of improved coupling methods should include: 1) a high fidelity signal, (2) a high signal-to-noise ratio, (3) availability in miniaturized devices and, if possible, (4) automatic switching. Whatever solutions are created, the functional outcomes must offer a 'technology which is at least equal to the quality of use that inductive coupling currently provides."[59]

VI. Analog Services Remain Critical for Now, but Should not Remain the Only Alternative for Hearing Aid and Cochlear Implant Users.

In the Commission's Biennial Regulatory Review proceeding, sentiment among consumers was strong that analog services should not be eliminated until digital access is secured for hearing aid and cochlear implant users.[60] We agree. The Commission's proposals in its Biennial Regulatory Review proceeding are inextricably linked to the proposals contained in the instant proceeding. So long as digital wireless technologies

[59] H. Rep. No. 97-888 at 8.
[60] Biennial Regulatory Review Comments of the NAD at 3 (Aug. 1, 2001); Biennial Regulatory Review Reply Comments of SHHH at 3.

remain inaccessible to hard of hearing individuals, the Commission should retain its "analog rule," requiring the continued carriage of analog transmissions. In addition, pursuant to its authority under Section 255 of the Communications Act, pending an effective solution for wireless compatibility with digital phones, the Commission should require the continued sale of analog handsets as well as the continued offering of analog services at the point of sale. This measure will ensure that individuals who use hearing technologies can continue to purchase accessible wireless equipment and service.

At the same time, individuals with hearing disabilities should not be relegated to analog service on a permanent basis, as this technology becomes outdated and inferior. We note that SHHH has stated that persons who are hard of hearing do not wish to be stuck in an analog "ghetto."[61] Rather, consumers wish to have the same range of options available to them as are enjoyed by all digital wireless subscribers. Such options include, but are not limited to, voice mail, caller ID, text messaging, personal organizers, Internet access, and schedulers, all in a single compact unit and available at competitive prices. As SHHH has noted, these features increase mobility and expand the capabilities of those individuals fortunate enough to be able to use them. Eliminating the HAC exemption for all CMRS will guarantee that growing numbers of hard of hearing Americans will be able to choose among the rich selection of digital wireless features in the packages and plans that best meet their needs.

VII. The Industry Should be Directed to Provide Consumers with Information about Accessibility and Compatibility Features.

Members of the hard of hearing community, audiologists, and other professionals find it extremely difficult to obtain information about the compatibility, accessibility, and

[61] Biennial Regulatory Review Comments of SHHH at 8.

usability of wireless telephones. Although the RERC staff has written many articles for consumer and audiological publications about the problem, we can do little more than advise hard of hearing consumers to engage in a frustrating exercise of trial and error. We cannot give straightforward guidance because the wireless industry is unable to direct us to the handsets that are the most usable with hearing aids. Wireless industry representatives and sales personnel are poorly equipped to assist customers who use hearing aids.[62] Often consumers confront misinformation and even false claims when trying to get information about access features.[63] It is not merely a matter of training; there is not enough product information to give sales personnel so that they could do a reasonable job of informing customers. The websites of digital wireless carriers and manufacturers provide virtually no mention of (1) matters concerning access for hard of hearing persons (2) hearing aid compatible handsets, (3) analog service, or (4) the measurement matrix designed by the wireless and hearing aid industries.

Manufacturers and service providers of digital wireless services already have an existing obligation under Section 255 to provide product and service information about accessible features and functions.[64] The Commission's rules implementing that section direct companies to make their offerings "usable by" people with disabilities, *i.e.*, so that such individuals can effectively learn about and operate accessible features.[65] Section

[62] *See e.g.,* Comments of Barbara Vick, California Foundation for Independent Living Centers (Oct. 11, 2000) (general response from sales personnel to questions about hearing aid compatibility was "dumfoundedness" and a "lack of understanding in general;" they just told me to "turn up the volume"); Comments of Penny Allen (Oct. 4, 2001) (none of the various carriers or stores visited knew anything; "I could not test the phone without purchasing it first"); Comments of Bert Lederer (Oct. 10, 2000) (consumer reported that stores had "no idea" what he was talking about); Sonya Miller (Oct. 31, 2000) (salespeople had no idea about technology that could help).
[63] *See e.g.*, Comments of Ralph Abramson (Sept. 28, 2000).
[64] The Commission's Section 255 rules direct companies to fulfill this usability requirement if readily achievable. 47 C.F.R. §6.11. The RERC is unaware of any situation in which the provision of information about accessibility features is not readily achievable.
[65] Section 255 R&O at ¶23.

255 rules require information provided to consumers to include documentation on products in general and specifically about the accessibility and compatibility features of these products.[66] Among other things, companies must make this information available through call centers and other customer support services.[67]

The Commission's rules on product and service usability need to be enforced and should be replicated in the Commission's final rules on wireless compatibility. Companies should be directed to make available to consumers information about access features, including the measurement matrix, internal designs for compatibility, and external accessibility components, where these are available. In addition, companies should be directed to train their customer representatives as well as other sales personnel about measures designed to achieve compatibility. Finally, companies need to revise their websites to incorporate sections on accessibility and compatibility.

VIII. **Compatibility May Be Phased In**

The Commission asks whether a limited exemption, one that would require the compatibility of some, but not necessarily all, digital telephones within a product line, would be acceptable to consumers. Based on past consumer comments under other proceedings, the RERC doubts that consumers support a product line approach on a permanent basis, but does see the utility in adopting this approach on an interim basis, to allow hearing aid compatibility to be phased into digital wireless phones. To this end, the RERC proposes the following phase-in schedule until such time that universal HAC is achieved. This schedule is designed to ensure that consumers have choices among

[66] 47 C.F.R. §§6.3; 6.11 (a)(1).
[67] 47 C.F.R. §§6.11(a)(3).

various carriers and manufacturers, on phones that have representative features, functions, and prices during the interim limited exemption period:

1. Two compatible digital telephones within two years. We recommend that the Commission set a benchmark for manufacturers of at least two digital wireless telephone models that are compatible with hearing aids and cochlear implants within two years of the effective date of the Commission's regulations.

2. Three compatible digital telephones within three years. By the third year after the effective date of the rule, we recommend that this number of models be increased to three.

3. Consumer education. During the interim limited-exemption period, the Commission should require manufacturers and service providers to undertake significant efforts to educate consumers about interim HAC features, so that consumers with hearing loss have the information they need to purchase useable wireless phones with the least amount of interference.

4. Reporting requirement. We ask that the Commission require reports at least twice yearly from manufacturers of digital wireless telephones until the requirements have been satisfied. It is our observation that such reports, while unpopular, do keep companies focused on making progress and aid in communication among the stakeholders. It is also our observation that submission of reports through a forum is effective.

5. Continuation of analog phones and service. Until accessible handsets begin to appear, we recommend that consumers be able to buy HAC analog phones and services through carriers that have offered analog service, and that existing analog customers be allowed to retain analog service without a reduction in service quality.

6. Full compliance by 2006. We recommend that the Commission set a deadline of July 1, 2006 for achievement of hearing aid compatible handsets.

IX. **Conclusion**

The RERC applauds the Commission for initiating this proceeding and appreciates the opportunity to submit the above recommendations. We request that the Commission eliminate the HAC exemption for telephones used with public mobile services in order to ensure the independence and productivity of millions of Americans who now use hearing aids and cochlear implants.

Respectfully submitted,

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